Article

A three stage analysis of motivational and behavioural factors in UK internet gambling

Mulkeen, James, Abdou, Hussein and Parke, Jonathan

Mulkeen, James, Abdou, Hussein ORCID: 0000-0001-5580-1276 and Parke, Jonathan (2017) A three stage analysis of motivational and behavioural factors in UK internet gambling. Personality and Individual Differences, 107 . pp. 114-125. ISSN 0191-8869

It is advisable to refer to the publisher's version if you intend to cite from the work.
http://dx.doi.org/10.1016/j.paid.2016.11.007

Full reference: Mulkeen, J., Abdou, H. A. and Parke, J. (2017) ' A three stage analysis of motivational and behavioural factors in UK internet gambling', *Personality and Individual Differences*, 107, pp. 114-125.

A three stage analysis of motivational and behavioural factors in UK internet gambling

James Mulkeen
Salford Business School, University of Salford, Salford, Greater Manchester, M5 4WT, UK

Hussein A. Abdou*
Huddersfield Business School, University of Huddersfield, Huddersfield, West Yorkshire, UK, HD1 3DH

Jonathan Parke
Salford Business School, University of Salford, Salford, Greater Manchester, M5 4WT, UK

*** Correspondence Author**
Dr. Hussein Abdou
Professor of Finance & Banking
Huddersfield Business School
University of Huddersfield, Huddersfield
West Yorkshire
HD1 3DH
UK
Tel.: +44 1484473872
Fax: +44 1484473148
Email: h.abdou@hud.ac.uk

A three stage analysis of motivational and behavioural factors in UK internet gambling

Abstract
This paper uses the Problem Gambling Severity Index (PGSI) to determine differences in UK internet player responses to their motives for gambling online. It also evaluates their views relating to responsible gambling practices and behavioural factors. A three stage analysis applying Structural Equation Modelling (SEM); multiple regression; and multinomial logistic regression is used. The main research instruments is an internet based questionnaire. Our findings for the motivation factors highlight that the most significant factors which players perceive are escape and relaxation; financial motivation; and social and competition. In terms of player views in relation to responsible gambling practices and behavioural factors both self-exclusion and self-help; and game design are identified as the key factors. Other factors such as proactive responsible gambling; transparent terms and conditions; and use of player information are not acknowledged as significant factors by players. This study also suggests that the financial motive to gamble should be divided into the following sub-motives: 'to win money' and to 'earn income'. Our main policy recommendation includes the need for a more transparent system that places emphasis on tangible or auditable means of demonstrating ethical responsibilities, and to determine areas of improvement.

Key words: Internet gambling; SEM; Responsible gambling; Financial motives; Behavioural motives

JEL Classification: L83; O41

1. Introduction

In general there is agreement that there has been significant growth in Internet gambling, that its popularity has increased and that the industry is likely to experience further continued growth as technological and Internet developments occur and the market becomes more liberal (Global Betting and Gaming Consultants (GBGC), 2007, 2009, 2010; Gainsbury, Parke, & Suhonen, 2012; Gainsbury, Russell, Wood, Hing, & Blaszczynski, 2015). Whilst the growth in internet gambling has presented many benefits, such as increased government revenue and leisure opportunities, it has also presented challenges for many regulatory and legislative authorities who have found it difficult to effectively regulate the social, commercial and clinical aspects of the Internet gambling industry (Rose & Owens, 2005; Balestra & Cabot, 2006).

Within the UK, the increased popularity and significance of Internet gambling has occurred in an era where the state and organisations are jointly responsible as guardians and guarantors of corporate citizenship (O'Dwyer, 2003; Cochran, 2007). Whilst corporate citizenships suggests that the ultimate responsibility to gamble responsibly rests with the individual player, it also places a requirement on gambling organisations to provide their customers with sufficient, necessary and timely information so that they understand the nature and risks associated with the games, products and services that they use. In addition, such citizenship requires those providing gambling products and services to balance the need for the individual player to self-identify and self-regulate their behaviour with the organisations obligation to ensure that they operate in a responsible, transparent and non-exploitative way whilst making a profit (eCOGRA, 2007; Blaszczynski, Ladouceur & Shaffer, 2008; Blaszczynski, Collins, Fong, Ladouceur, Nower, Shaffer, Tavares, & Venisse, 2011).

The main aims of this paper are to investigate UK players' perception of their motives for gambling online; and to evaluate their views on responsible gambling practices and behavioural factors. Our novel contribution includes applying a fresh methodology with a three stage analysis to identify players' motivations and behaviours. The methodology uses Structural Equation Modelling (SEM), multiple regression and multinomial logistic regression, which represents an original approach to the current literature. Whilst the study identifies a number of original contributions, we uniquely identify two sub-categories of financial motivation which are 'to win money' and to 'earn income'. In addition, we identify 'game design' and 'self-exclusion and self-help' as the main factors affecting gambling behaviour. Our paper findings also question the ethical effectiveness of self-regulation which should underpin systems of corporate social responsibility.

The rest of this paper is organised as follows: section 2 reviews the relevant literature; section 3 outlines the research methodology; section 4 outlines key results and discussions; and section 5 provides summary conclusions and suggests areas for future research.

2. Review of relevant literature

An individual may gamble for a variety of reasons such as for enjoyment, as a coping mechanism, for financial reasons, and for social reasons (Walker, Hinch & Weighill, 2005; Lee, Lee & Kim, 2007; Abdi, 2014). Some studies have associated motivation to gamble with age (Clark & Clarkson 2007; Gupta, Nower, Derevensky, Blaszczynski, Faregh, & Temcheff, 2013), and gender (Walker et al. 2005; Corney & Davis 2010) and others have evaluated gender preferences for specific gambling activities (eCOGRA, 2007; Parke, Griffiths & Parke, 2007; Wood & Williams, 2009). Gainsbury et al. (2015) also acknowledge differences in the profile of those who gamble online when compared to those who gamble using land based venues. In general these studies conclude that females are more likely to be motivated to play games of chance whereas males are motivated to play games based on skill.

In relation to motives to gamble, Lee et al. (2007) propose a model based on the following factors: excitement; socialization, avoidance, monetary and amusement. Whilst they conclude that the five-factors are highly reliable/consistent (alpha = 0.92), they suggest that the monetary motive is most effective in explaining gambling motivation and severity. They eliminate the social motive as it has no effect on the monetary motive, and they conclude that whilst the avoidance and excitement motives show no direct influence on gambling motivation and severity, they do exert an indirect influence through the monetary motive. An alternative model of gambling motivation is proposed by Lloyd, Doll, Hawton, Dutton, Geddes, Goodwin and Rogers (2010) who highlight the following three primary motives for

gambling: mood regulation; to obtain money and for enjoyment. They conclude that the more an individual plays the stronger their gambling motivation to regulate mood, obtain money and seek enjoyment when compared with those who did not have a gambling problem. They also report that females played more to regulate their mood, are less motivated by money and are less likely to derive enjoyment from gambling activities when compared to males. In addition, older players tended to play to regulate mood. Clearly there are similarities between Lee et al. (2007) and Lloyd et al. (2010) models, for example the significance of money as a motive. However, there are differences between the models, for example, Lee et al. (2007) discount the social motive whereas Lloyd et al. (2010) highlight the significance of social motive via mood regulation and enjoyment. Consequently, our paper develops on previous studies; and therefore the significance of financial, social and enjoyment factors, apart from other factors, are considered in this paper. In addition, our paper investigates whether there is a link between the identified motives to gamble and PGSI individual scores and PGSI classification.

Managing the relationship between an individual's motivation to gamble and their ability to manage their gambling behaviour in a responsible way is both complex and multi-faceted. Whilst the management of this relationship has been further complicated by the lack of a global regulation system, there is growing consensus that any management system should be based on the principle of self-regulation at an organisational level. For Power (2004) and Kingma (2004) this reflects established models of corporate social responsibility (CSR) where governments within each jurisdiction broadly outline standards which they expect organisations to meet. Individual gambling organisation and regulatory agencies in turn, become responsible for creating risk management and regulatory systems that demonstrate compliance and due diligence. Whilst this approach is driven, in part, by the global and

diversified nature of contemporary business organisations, which makes it impossible to legislate for individual eventualities, one practical problem of this system is that it places greater emphasis on the monitoring of such self-regulation if the organisations responsible gambling features and tools are to be perceived as credible and effective. To achieve this aim many organisations legitimise their operational practices through third party accreditation, however, the success of such third part accreditation is questionable, as Gainsbury et al. (2012) suggests that there is conflicting evidence as to whether it is understood by consumers and whether it affects their motivation to gamble and their actual gambling behaviour.

With greater emphasis on organisations not only needing to act in a responsible way but also being perceived as acting in a responsible way (Griffiths 2009a, 2012; Schellinck & Schrans 2007; Gambling Commission, 2008; Hancock, Schellinck & Schrans, 2008; and Hing & Breen 2008) there is an increased need for players to be aware of, to understand and to trust the products and services that they use. This need places an increased obligation on gambling providers to understand what motivates an individual to gamble and to acknowledge the factors that may cause harm to those using their products and services. This is further complicated as there is agreement that players regard responsible gambling features as important and valuable (Parke et al. 2007 and Wood & Griffiths, 2007, 2008) but their use by players is relatively low, and is lower where engagement with such features is voluntary (Griffiths, 2009a, 2012; Australian Parliamentary Joint Select Committee on Gambling Reform, 2011).

To date, there is limited understanding of player perceptions of the effectiveness of operator self-regulation as a consumer protection tool in responsible Internet gambling (Wood & Williams, 2009, 2011; and Gainsbury et al. 2012). As such, our paper explores consumer perceptions of responsible gambling by evaluating players' perceptions of motives to gamble

online and their opinions relating to gambling practices and behavioural factors that enable them to gamble in a responsible and ethical way.

3. Methodology

A web based questionnaire is used to collect responses from players who had accessed an online gambling site in the previous 3 months. The questionnaire contains 113 questions consisting of both open and closed questions (no further information is provided in relation to both motivational and behavioural factors using open questions). Divided into four sections, the first section of the questionnaire is designed to obtain consent from participants and collect information on their behaviour including the types of games played and frequency of play. Standard Problem Gambling Severity Index (PGSI) questions are used to determine an individual's PGSI score and classification. The PGSI consists of nine questions using a four point Likert-scale i.e. 'never = 0', 'sometimes = 1', 'most of the time = 2', 'almost always = 3'. Based on participants' responses, a numerical score is obtained resulting in the following classifications: score of 0 = 'Non-problem group'; score of 1 or 2 = 'Low problem group'; score of 3 to 7 = 'Moderate problem group' and score of 8 or more = 'Problem group'.

Section two focuses on players perceptions of the factors that motivate them to play[1]. These include factors such as relaxation, excitement, boredom, financial and social. Section three establishes player attitudes towards 52 responsible gambling statements on responsible gambling practices and behavioural factors using a seven point Likert-scale (whereby 1= strongly disagree and 7 = strongly agree). These statements relate to, for example, self-exclusion options, perceived knowledge of staff, problem gambling information, advice and referral in relation to problem gambling, limit setting, play for free facilities and practices,

[1]This section also includes the factors which they perceive cause harm. However, responses to these questions have not been included in this paper.

game design protocols, player analytics and stakeholder involvement in research. The final part of the questionnaire relates to socio-demographic information including age, gender and ethnic background. It should be emphasised that PGSI is determined using established measures whilst the remainder of question included in our questionnaire are developed specifically for this study. Web-based surveys have been used in previous studies and are acknowledged as a suitable method for investigating Internet gambling behaviour (see for example, Wood *et al*., 2007 and Griffiths *et al*., 2009a, 2009b). Informed consent is provided electronically as part of the web survey. The questionnaire was sent to a number of experts in both academia and the gambling industry for validity purposes. In addition Cronbach's alpha is calculated for both stages achieving 0.814 and 0.853 for motivational and for behavioural factors respectively.

Participants: The study is based on a self-selected sample of 617 questionnaires recruited through hyperlinks placed on a prominent UK newspaper/online newspaper and a number of UK University websites. 425 questionnaires, (achieving a 68.88% response rate) are classed as reliable. Being consistent with other studies, participants are required to have engaged in Internet gambling in the past three months (eCOGRA, 2007, Parke et al. 2007). The opportunity to win an *I-Pad* is used as an incentive to improve participation in this study. The use of such an incentive is considered acceptable and a low risk method to improve participation rates in gambling research as its structural characteristics (no stake, little player involvement, no chasing potential, delayed outcome determination, weak schedule of determination and weak schedule of reinforcement) are unlikely to stimulate additional gambling activity (Parke et al. 2007; Griffiths 2009b). 293 (69%) of the final sample are males, the modal age is 21-26 years, and the modal frequency of play is 2-3 times per week. Respondents are classified in terms of the PGSI problem severity groups as follows: 94

(22%) problem; 132 (31%) moderate problem; 110 (26%) low problem; and 89 (21%) no problem group. The method of data analysis is divided into the following three stages:

3.1. First stage: Structural Equation Modelling

3.1.1. Structural Equation Modelling (SEM)

SEM[2] is a confirmatory multivariate technique that includes the measurement errors in the model, and allows the researcher to measure the relationships between the latent and the observed variables. SEM establishes both measurement and structural models to address complicated relationships (Hair, Barry & Babin, 2010). The measurement model aims to evaluate the instruments' quality in terms of internal consistency and discriminant validity and reliability. Partial least square technique is employed in PLS-SEM. The measurement model should be assessed in relation to validity and reliability concerns (Brown, 2006). These include construct validity and composite reliability. Construct validity refers to how the constructs are measured by the instrument. Construct validity includes two sub-types, discriminant and convergent validity. Discriminant validity means that the constructs must be different from other related constructs. Convergent validity refers to the extent of correlation between measures of the same construct, which should be related in reality (Grob, 2003). Average variance extracted (AVE) is used to assess discriminant and convergent validity (Dalgaard, 2008, Fornell and Larcker, 1981). AVE refers to the overall amount of variance in the items accounted for by a latent construct (Bland and Altman, 1994). Convergent validity is adequate if AVE $\geq$ 0.50 and discriminant validity exists if the Square roots of AVEs are greater than the inter-construct correlation (Kock, 2015). Reliability refers to 'a statistical measure of how reproducible the survey instrument's data are' (Litwin, 1995). It is measured by calculating Cronbach's alpha, which measures the homogeneity of a scale formed of

[2]For the purpose of comparing the SEM results and in order to evaluate the accuracy of our models, we consider Principle Component Analysis (PCA) in our analysis, for more details see the Appendix.

multiple items. Furthermore, composite reliability (CR) verifies the validity of the constructs, reflecting how error affects the scale (Field, 2009). WarpPLS software version (5) was used for analysis purposes[3].

3.2. Second stage: Multiple Regression

Our regression uses the outcomes of the SEM[4] for both the motivational factors and the factors relating to the responsible gambling practices and behavioral factors. PGSI individual scores are used as the dependent variable.

Regression Model$_1$ (R_1): PGSI individual score as a dependent variable on the player motivational factors identified in SEM[5].

$$PGSI = \alpha + \delta_1 \text{ x } E + \delta_2 \text{ x } RE + \delta_3 \text{ x } FM + \delta_4 \text{ x } AM + \delta_5 \text{ x } SC + e_i$$

where,

$\propto$ = Intercept, a measure of the mean for the responses when all predictor variables are at value 0 (zero); δ = delta function or slope measuring the rate of change in PGSI individual scores given the change in each of the predictor variables; PGSI refers to Problem Gambling Severity Index; E refers to excitement; RE refers to relaxation and escape; FM refers to financial motivation; AM refers to autonomy and mastery; SC refers to social and competition; and e_i refers to noise error term.

[3]For more details regarding Structure Equation Modeling the reader is referred to Crowley and Fan (1997), Boomsma (2000), Kaplan (2000), Barrett (2007), Hooper, Coughlan and Mullen (2008), Asparohov and Muthén (2009) and Byrne (2009). Also the reader is referred to Kock (2010), Kock (2011a), Kock (2011b) and Kock and Verville (2012) for more details regarding WarpPLS analysis.
[4]This also has been confirmed by the PCA results.
[5]This also has been confirmed by the PCA results.

Regression Model$_2$ (R_2): PGSI individual score as a dependent variable on responsible gambling practices and behavioural factors identified in SEM[6]

$$PGSI = \alpha + \delta_1 \text{ x } PRG + \delta_2 \text{ x } TTC + \delta_3 \text{ x } CS + \delta_4 \text{ x } SESH + \delta_5 \text{ x } GD + \delta_6 \text{ x } PIBT + e_i$$

where,

$\propto$ = Intercept, a measure of the mean for the responses when all predictor variables are at value 0 (zero); δ = delta function or slope measuring the rate of change in PGSI individual scores given the change in each of the predictor variables; PGSI refers to Problem Gambling Severity Index; PRG refers to proactive responsible gambling; TTC refers to transparent terms and conditions; CS refers to customer service; SESH refers to self-exclusion and self-help; GD refers to game design; PIBT refers to player information, behaviour and transaction; and e_i refers to noise error term.

3.3. Third stage: Multinomial Logistic Regression

Where the dependent variable is nominal, multinomial logistic regression is used. We use the PGSI categories as a dependent variable with both the motivational factors and the factors related to the responsible gambling practices and behavioral factors. PGSI group classifications are used here as the focus is on determining differences within responding groups using a single classification variable.

Multinomial Regression Model$_1$ (MR_1): PGSI category as a dependent on the player motivational factors identified in SEM[7]

[6]This also has been confirmed by the PCA results.
[7] This also has been confirmed by the PCA results.

$$1(\boldsymbol{\alpha}, \boldsymbol{\beta}) = \prod_{i=1}^{n} [\boldsymbol{\pi_1}(\boldsymbol{X_i})^{E}\, \boldsymbol{\pi_2}(\boldsymbol{X_i})^{RE}\, \boldsymbol{\pi_3}(\boldsymbol{X_i})^{FM}\, \boldsymbol{\pi_4}(\boldsymbol{X_i})^{AM}\, \boldsymbol{\pi_5}(\boldsymbol{X_i})^{SC}]$$

where,

1 is the usual indicator function using PGSI group classification; α and $\boldsymbol{\beta}$ are the model parameters; $\boldsymbol{\pi}_1, \boldsymbol{\pi}_2 \ldots \boldsymbol{\pi}_n$ are the probabilities of various independent variables namely: E refers to excitement; RE refers to relaxation and escape; FM refers to financial motivation; AM refers to autonomy and mastery; SC refers to social and competition; and X_i is the covariates of each of the indicator variables which is 1 if the indicator variable is of type 1, or 0 otherwise, etc.

Multinomial Regression Model₂ (MR₂): PGSI category as a dependent variable on responsible gambling practices and behavioural factors identified in SEM[8]

$$1(\boldsymbol{\alpha}, \boldsymbol{\beta}) = \prod_{i=1}^{n} [\boldsymbol{\pi_1}(\boldsymbol{X_i})^{PGR}\, \boldsymbol{\pi_2}(\boldsymbol{X_i})^{TTC}\, \boldsymbol{\pi_3}(\boldsymbol{X_i})^{CS}\, \boldsymbol{\pi_4}(\boldsymbol{X_i})^{SESH}\, \boldsymbol{\pi_5}(\boldsymbol{X_i})^{GD}\, \boldsymbol{\pi_6}(\boldsymbol{X_i})^{PIBT}]$$

where,

1 is the usual indicator function using PGSI group classification; α and β are the model parameters; $\boldsymbol{\pi}_1, \boldsymbol{\pi}_2 \ldots \boldsymbol{\pi}_n$ are the probabilities of various independent variables namely: PRG refers to proactive responsible gambling; TTC refers to transparent terms and conditions; CS refers to customer service; SESH refers to self-exclusion and self-help; GD refers to game design; PIBT refers to player information, behaviour and transaction; and X_i is the covariates of each of the indicator variables which is 1 if the indicator variable is of type 1, or 0 otherwise, etc.

[8] This also has been confirmed by the PCA results.

4. Results and discussion

We identify the player motivational factors; and responsible gambling practices and behavioural factors using a three stage analysis: Structural Equation Modelling; multiple regression; and multinomial logistic regression. In order to achieve our aims, the Problem Gambling Severity Index (PGSI) is used as the focus for comparison[9]. The logic behind applying our three stage analysis is that a stage outcome is used as an input for the next stage. For example, the outcomes of our first stage namely SEM are used as inputs for the second stage modelling namely multiple regression. This ensures consistency in approach and has the power to link crucial characteristics of our complex modelling with each other. This clearly is of benefit to different group of stakeholders, as the more detail included in each model about a player's motivations and behaviours enables more effective and relevant decisions to be made. For example, our third stage analysis namely multinomial logistic regression provides a greater level of detail in relation to each of the problem gambling groups and their motivations and behaviours. This approach can also be applied in different areas of research'

4.1. First stage: Structural Equation Modelling

For our SEM models namely player motivational factors and responsible gambling practices and behavioural factors, we report SEM in two sections. The first section reports the measurement model and its validation. The second section reports the structural model which measures the causal relationship between the constructs of the study[10].

[9]This is a self-reporting screening method used to measure problem gambling in the general population as opposed to a clinical situation and it categorises individuals on a scale from non-problem to problem gambler based on responses which are characterised on a four point scale (0=never; 1=sometimes, 2=most of the time, 3=almost always (Ferris & Wynne, 2001). Based on the score achieved, the PGSI identifies different subgroups of problem gamblers based on their risk status: (no, low, moderate, and high problem). As PGSI is used to classify problem gambling within the general population it is used in this paper.

[10]Structural model is a consequence of the measurement model. Invalid measurement model means there will be no structural relationships.

4.1.1. Structural Equation Modelling (SEM_1): player motivational factors

The measurement model: it measures the correlation between indicators and their constructs, using a group of fit indices to measure its model fit using partial least square method as shown in Table 1. These fit indices are all within target limits (see for example, Kock, 2015).

TABLE 1 HERE

The measurement validity and reliability[11]*:*

From Table 2, it is revealed that AVEs are greater than 0.50 and convergent validity of the measurement model is evident. In addition, square roots of AVEs are greater than correlations among constructs and discriminant validity exists. Cronbach's alpha values are greater than 0.60 and CR values exceed 0.70 and the measurement model constructs are reliable.

TABLE 2 HERE

The structural model: it measures the causal relationships between independent variable and the outcome variable. Five independent variables are regressed on one dependent variable (PGSI: see Figure 1). It is revealed that four out of five independent variables have a significant effect on the outcome variable: excitement (β=0.21 and P<0.01); escape and relaxation (β=0.18 and P<0.01); financial motivation (β=0.24 and P<0.01); and social and competition (β=-0.16 and P<0.05). These four variables explain 10% of the problem gambling severity index (R^2=0.10). The other independent variable is found not significantly affecting the outcome variable: autonomy and mastery (β=-0.07 and P>0.05).

[11] This applies to both SEM_1 (player motivational factors) and SEM_2 (responsible gambling practices and behavioural factors).

FIGURE 1 HERE

Whilst our identified factors are to some extent similar in terminology (our findings reflects previous studies such as Lee et al. (2007) and Lloyd et al. (2010) in terms of identifying excitement, social and escape), the sub-factors are different. We identify a generic factor relating to 'autonomy and mastery' which includes sub-motives of 'to be mentally challenged', 'to do something I enjoy for a change' and 'it's fun'. Although not significant within the model, it may be worth noting that Internet gambling may enable individuals to satisfy their human need of 'autonomy and mastery' especially where it cannot be achieved in other aspects of their life such as work, leisure or family. In addition, whilst previous studies have identified financial factors as one motive, within this study financial motives are categorised in terms of 'to win money' and to 'earn income', as identified in the first phase of our analysis. Each of these sub-motives is significant to different consumer groups based on PGSI category. This is significant as those in the PGSI problem category are more likely to be motivated to earn income from their gambling activity than other groups.

4.1.2. Structural Equation Modelling (SEM_2): responsible gambling practices and behavioural factors

The Measurement model: the fit indices of the measurement model are shown in Table 3. These fit indices are all within target limits (see for example, Kock, 2015). From Table 4, it revealed that AVEs are greater than 0.50 and convergent validity of the measurement model is evident. In addition, square roots of AVEs are greater than correlations among constructs and discriminant validity exists. For reliability, both Cronbach's alpha values and CR values are greater than 0.70 and the measurement model constructs are reliable.

TABLE 3 HERE

TABLE 4 HERE

The structural model: six independent variables are regressed on one dependent variable (PGSI: see Figure 2). It is revealed that two out of six independent variables have a significant positive effect on the outcome variables: self-exclusion and self-help (β=0.33 and P<0.01); and game design (β=0.32 and P<0.01). These two variables explain 40% of the problem gambling severity index (R^2=0.40). The other four independent variables are found not to significantly affect the outcome variable: proactive responsible gambling (β=-0.01 and P>0.05), transparent terms and conditions (β=0.03 and P>0.05), customer service (β=-0.07 and P>0.05), and consumer Information, behaviour & transaction (β=-0.06 and P>0.05).

FIGURE 2 HERE

Reflecting the conclusion of Parke et al. (2007) and Wood & Griffiths (2008), our results indicate that players acknowledge the importance of factors such as the availability to self-exclude and responsible game design in moderating their gambling behaviour. Our findings suggest that the current emphasis on self-regulation at a player level may not be effective as participants did not acknowledge factors associated with proactive responsible gambling, transparency, customer services and information relating to their actual gambling behaviour.

SEM[12] form the basis on which to apply multiple regression and multinomial logistic regression models to determine differences in player perceptions of motives to gamble and responsible gambling practices and behavioural factors.

4.2. Second stage: Multiple Regression models

In relation to motivation to gamble and behavioural factors, multiple regression is undertaken using PGSI individual scores with these factors which are identified by SEM.

4.2.1. Player motivational factors

As shown in Table 5, the model is significant at the 99% confidence level ($p < 0.001$) with an R^2 value of 0.169 (R^2 adjusted value of 0.157) suggesting that 16.9% of changes in an individual's PGSI individual score is accountable by motivational factors. Of the independent variables, there are significant differences between groups at the 99% confidence level for financial motivations ($p < 0.001$) and escape and relaxation ($p < 0.001$); at the 95% confidence level for social and competitive reasons ($p < 0.02$)[13].

TABLE 5 HERE

In terms of excitement and financial motives, these are positively related to PGSI scores suggesting that the higher the score, the more important financial and excitement motives are. For escape and relaxation and social and competition, there is a negative relationship with PGSI score suggesting that the higher the PGSI score the less important these factors are. Furthermore, finance and the need for escape and relaxation are the most important factors

[12]PCA results are consistent with SEM results, and also considered in forming both multiple regression and multinomial logistic regression models, see Appendix for details.

[13] There is significant differences for excitement at the 90% confidence level ($p < 0.085$). This is an area for future research where more data could be collected to investigate whether it would be more significant?

that motivate an individual to gamble, as shown in see Table 5. Finally and consistent with the SEM results, our regression model finds that autonomy and mastery is not statistically significant.

4.2.2. Responsible gambling practices and behavioural factors

As shown in Table 6, regression is undertaken using PGSI individual scores as the dependent variable and the six extracted factors as the independent variables. The model is statistically significant at the 95% confidence level, and accounts for approximately 57% R^2 (36% R^2 Adjusted), of changes in PGSI individual scores. As shown in Table 4 both 'self-exclusion and self-help' and 'game design' are statistically significant at the 99%, and the 95% confidence level, respectively. In addition, 'transparent Terms and Conditions' is statistically significant at the 90% confidence level. The VIF figures suggest that multi-collinearity is not an issue in our sample, as shown in Table 6.

TABLE 6 HERE

For 'self-exclusion and self-help' there is a negative relationship with the PGSI scores suggesting that the higher the score, the less important this factor is. By contract, 'game design' is positively related to PGSI scores, suggesting that those with a higher score place a higher value on this factor. In addition, 'transparent terms and conditions' is also positively related to PGSI scores suggesting that this is relatively important to those who are classified as problem gamblers. Finally and consistent with the SEM results, our regression model finds that proactive responsible gambling; player information, behaviour and transactions; and customer service are not statistically significant. Whilst, these results support previous studies which highlight the significance of game design as a factor affecting gambling behaviour

(Griffiths, 2009b); our study adds the following two factors namely self-exclusion and self-help' and 'transparent terms and conditions', as being important factors in relation to gambling practices and behavioural factors.

4.3. Third stage: Multinomial regression models

PGSI categories are regressed with the motivational and behavioural factors identified by SEM. Indeed multinomial logistic regression can provide details in relation to each of the PGSI categories and their relation to different factors, which is not possible to achieve applying SEM and multiple regression, as shown below.

4.3.1. Player motivational factors

Table 7 provides a summary of stepwise multinomial regression between PGSI classification and motivational factors using PGSI problem category as a reference group. The model is significant at the 99% confidence level, with Pseudo R^2 of 30.30% and an overall classification accuracy of 68.5%. This suggests that 30.3 % of PGSI categories results are from four motives to gamble which is consistent with the previous two stages' findings, as shown in Table 7.

TABLR 7 HERE

Those in the 'no problem' gambling category are more inclined to be motivated by 'escape and relaxation' when compared with other PGSI categories, and they are less motivated by financial factors when compared to those in the 'problem' category and *vice versa*. Whilst escape and relaxation has previously been identified as a core gambling motive among problem gamblers (see for example, Wood and Griffiths, 2007), this study suggests that this

motive is strongest amongst those in the 'no problem' category when compared with those in the 'problem' category. Those in the 'problem' category are generally more motivated by 'financial' and 'excitement' motives than those in the 'no problem' category[14].

4.3.2. Responsible gambling practices and behavioural factors

As shown in Table 8, we regress the PGSI categories and gambling practices and behavioural factors using PGSI problem category as a reference group. Generally, our results agree with the previous two stages' findings. The overall model is statistically significant at the 95% confidence level, with Pseudo R^2 of 11.90% and an overall classification accuracy of 36.20%.

TABLE 8 HERE

The results in Table 8 show that 'game design' is the main factor distinguishing between the 'no problem' and 'problem' gambling categories. Clearly, 'game design' is a more important factor affecting behaviour and practices of those in the 'problem' gambling category when compared to those in the 'no problem' gambling category[15]. Other factors namely 'self-exclusion and self-help' and 'player information, behaviour and transactions' are the most important factors for low problem gambling category. For those in the 'moderate problem' gambling category, there is a clear role for 'transparent terms & conditions', as shown in Table 6. These results may be significant for those designing 'self-help and self-regulation' tools, as our findings suggest that players do expect gambling organization to be more proactive in the way they identify and manage those who may have a problem with their gambling behaviour. Based on our findings, our investigation questions the ethical effectiveness of self-regulation.

[14] For more details see Appendix 2.
[15] For more details see Appendix 3.

6. Conclusion and areas for future research

This study has explored player perceptions of motivational factors; and responsible gambling practices and behaviours. Notably, we use a three stage analysis applying SEM, multiple regression and multinomial logistic regression. On the one hand, our SEM analysis identifies the following five motivational factors to gamble: excitement; escape and relaxation; autonomy and mastery; financial motivation; and social and competition. Whilst previous studies, for example, have identified financial factors as one motive, within our study financial motives are categorised in terms of 'to win money' and to 'earn income'. This response has policy implications as there may be a need for better signage and social marketing highlighting that gambling is entertainment and not a way to earn income. This policy implication relate specifically to problem gamblers who in our study are more likely to gamble to earn income. In addition, our results also identify 'autonomy and mastery' as a motivational factor. Although, it is not significant within the model, individuals may satisfy their need of 'autonomy and mastery' through the use of internet gambling especially where they cannot achieve it in other aspects of their work, leisure or family life. This is clearly an area of future research. Furthermore, our multiple regression and multinomial logistic regression analysis shed light on the relationship between those identified factors and PGSI scores and categories, respectively. We find that 'financial' factors are more important in motivating those in the 'problem' category; whilst the need to 'escape and relax' is more important to those in the 'no problem' category.

On the other hand, our results identify the following six gambling practices and behavioural factors: proactive responsible gambling; transparent terms and conditions; customer service; self-exclusion and self-help; game design; and player information, behaviour and transactions. Of these factors both 'self-exclusion and self-help'; and 'game design' are

identified as the most significant factors affecting an individual behaviour. Our results suggest that at present players fail to acknowledge the importance of proactive responsible gambling, transparency, customer services and information relating to their actual gambling behaviour. For these four factors, we recommend that UK gambling organisations should be aware of their importance for improving customer experience. Our finding questions the effectiveness of self-regulation on which many systems of corporate social responsibility are based. This is clearly another area of future research and something that may impact directly on customer experience and organizational due diligence. Indeed, our multiple regression analysis confirmed these findings. Furthermore, multinomial logistic regression analysis identified 'game design' as a main factor to distinguish between those in the 'problem' and 'no problem' categories.

Based on our three stage analysis for responsible gambling and behavioural factors, we recommend as a policy recommendation to the internet gambling sector the following: develop more effective systems for 'self-exclusion and self-help' (e.g. enhance their players knowledge of how to access and use support tools, standardise the way in which responsible gambling information is presented on gambling websites, reduce player fears of using support tools, introduce compulsory setting of effective time and financial limits, and develop an effective industry-wide self-exclusion system); and be aware of addictive aspects of game design. Additional research could be directed to determine whether the gambling industry may be able to contribute to and benefit from some of practices currently being developed in other sectors such as ethical finance.

References

Abdi, T. A. (2014). Gambling: Cultural Factors, Motivations and Impacts on Quality of Life. *Journal of Addictive Behaviour Therapy & Rehabilitation*, 3:4, 1-4.

Asparohov, T., & Muthén, B. (2009). Exploratory structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal*, 16, 397-438.

Barrett, P. (2007). Structural equation modelling: adjudging model fit. *Personality and Individual Differences*, 42, 815-824.

Balestra, M., & Cabot, A. N. (2006). The Internet gambling report. 9th ed. Las Vegas: Trace Publications.

Bland, J., & Altman, D. (1994). Regression towards the mean. *BMJ,* **308**(6942): 1499.

Blaszcznski, A., Ladouceur, R., & Shaffer H.J. (2008). Informed choice and gambling: principles for consumer protection. *The Journal of Gambling Business and Economics*, 103-118

Blaszczynski, A., Collins, P., Fong, D., Ladouceur, R., Nower, L., Shaffer, H.J. Tavares, H., & Venisse, J.L. (2011). Responsible gambling: general principles and minimal requirements. *Journal of Gambling Studies*, 27, 565–573.

Boomsma, A. (2000). Reporting analyses of covariance structures. *Structural Equation Modeling: A Multidisciplinary Journal*, 7, 461-483.

Brown, T. (2006). *Confirmatory factor analysis for applied research.* New York: Guilford Press.

Byrne, B. (2009). Structural equation modeling with AMOS: basic concepts, applications, and programming (2nd ed.). New York: Routledge/Taylor & Francis.

Clark, D., & Clarkson, J. (2007). A preliminary investigation into the motivational factors assocaited with older adults' problem gambling. *International Journal of Mental Health Addiction*, 7, 12-28

Cochran, P. L. (2007). The evolution of corporate social responsibility. *Business Horizons*, 50, 449-454.

Corney, R., & Davis, J. (2010). The attractions and risks of Internet gambling for women: A qualitative study. *Journal of Gambling Issues*, 24, 121-139.

Crowley, S., & Fan, X. (1997). Structural equation modeling: basic concepts and applications in personality assessment research. *Journal of Personality Assessment*, 68, 508-531.

Dalgaard, P. (2008). Introductory statistics with R, Statistics and Computing Series. 2nd ed.: Springer.

Field, A. (2009). Discovering statistics using SPSS, 3rd ed. SAGE, Thousand Oaks, California

Fornell, C., Larcker, D., (1981) Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research,* 18, 39-50.

Gainsbury, S., Parke, J., Suhonen, K. (2012). Consumer attitudes towards Internet gambling: Perceptions of responsible gambling policies, consumer protection, and regulation of online gambling sites. *Computers in Human Behavior,* 29, 235-245.

Gainsbury, S. M., Russell, A., Wood, R., Hing, N. & Blaszczynski, A. (2015). How risky is Internet gambling? A comparison of ubgroups of Internet gamblers based on problem gambling status, *New Media & Society*, 17, 861–879.

Gambling Commission (2008). Licensing conditions and codes of Practice. Birmingham: Gambling Commission.

Global Betting and Gaming Consultants (GBGC) (2007). Fewer Chips Without Fire? The Smoking Bans Go Global, UK.

Global Betting and Gaming Consultants (GBGC) (2010). Interactive gambling report, Isle of Man.

Grob, J. (2003). Linear regression. Lectures Notes in Statistics Series, 175. Springer.

Griffiths, M. D. (2009a). Internet gambling in the workplace. *Journal of Workplace Learning*, 21, 658-670.

Griffiths, M. D. (2009b). Social responsibility in gambling: the implications of real-time behavioural tracking. *Casino and Gaming International*, 5, 99–104.

Griffiths, M. D. (2012). Internet Gambling, Player Protection, and Social Responsibility. In R. WILLIAMS, R. WOOD and J. PARKE, (Eds.), Routledge handbook of Internet gambling. London: Routledge, pp. 227-249.

Gupta, R., Nower, L., Derevensky, J. L., Blaszczynski, A., Faregh, N. & Temcheff, C. (2013). Problem Gambling in Adolescents: An Examination of the Pathways Model, *Journal of Gambling Studies*, 29, 575–588.

Hair, J. F., Barry, W. C. & Babin, J. (2010). *Multivariate data analysis: a global perspective.* 7th ed.: Pearson Prentice Hall.

Hancock, L., Schellinck, T., & Schrans, T. (2008). Gambling and social responsibility: re-defining industry and state roles on duty of care, host responsibilities and risk management. *Policy and Society*, 27, 55-68.

Hing, N. & Breen, H. (2008). How working in a gambling venue can lead to problem gambling: The experience of six gaming venue staff. *Journal of Gambling Issues*. 21, 11-29.

Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural Equation Modelling: Guidelines for Determining Model Fit. *Electronic Journal of Business Research Methods*, 6, 53-60.

Kaplan, D. (2000). Structural Equation Modeling: Foundations and Extensions. London: Thousand Oaks, CA: Sage Publications.

Kingma, S. F. (2004). Gambling and the risk society: The liberalisation and legitimation crisis of gambling in the Netherlands. *International Gambling Studies*, 4, 47–67.

Kock, N. (2010). Using WarpPLS in e-collaboration studies: An overview of five main analysis steps. *International Journal of e-Collaboration*, 6, 1-11.

Kock, N. (2011a). Using WarpPLS in e-collaboration studies: Mediating effects, control and second order variables, and algorithm choices. *International Journal of e-Collaboration*, 7, 1-13.

Kock, N. (2011b). Using WarpPLS in e-collaboration studies: Descriptive statistics, settings, and key analysis results. *International Journal of e-Collaboration*, 7, 1-18.

Kock, N., & Verville, J. (2012). Exploring free questionnaire data with anchor variables: An illustration based on a study of IT in healthcare. *International Journal of Healthcare Information Systems and Informatics*, 7, 46-63.

Kock, N. (2015). *WarpPLS 5.0 User Manual.* Laredo, TX:: ScriptWarp Systems.

Lee, H. P., Chae, P. K., LEE, H. S. & Kim, Y. K. (2007). The 5 factor gambling motive model, *Psychiatry Research*, 150, 21-32.

Litwin, M. (1995). How to measure survey reliability and validity. California, USA: SAGE publications, Inc.

Lloyd, J., Doll, H., Hawton, K., Dutton, W. H., Geddes, J. R., Goodwin, G. M. & Rogers, R. D. (2010). How Psychological Symptoms relate to different motivations for gambling: An online study of internet gamblers, *BIol Psychiatry*, 68, 733-740

O'Dwyer, B. (2003). Conceptions of corporate social responsibility: the nature of managerial capture. *Accounting, Auditing and Accountability Journal*, 16, 523-557.

Parke, J., Griffiths, M. D., & Parke, A. (2007). Positive thinking among slot machine gamblers: a case of maladaptive coping?. *International Journal of Mental Health and Addiction*, 5, 39–52.

Power, M. (2004). The Risk Management of Everything Rethinking the politics of uncertainty London: Demos

Rose, I. N., & Owens, M. D. (2005). Internet Gaming Law. Larchmont, NY: Mary Ann Liebert, Inc.

Schellinck, T., & Schrans, T. (2007). The Nova Scotia player tracking data analysis: Focal Research Consultants Ltd, Halifax, Canada. Nova.

Walker, G. J., Hinch T. D., Weighill, A. J. (2005). Inter and Intra gender similarities and differences in motives for gambling. *Journal of Leisure Science*, 27, 111-130.

Wood, R. T. A., & Griffiths, M. D. (2008). Why Swedish people play online poker and factors that can increase or decrease trust in poker web sites: A qualitative investigation. *Journal of Gambling Issues*, 21, 80-97.

Wood, R. T. A., & Griffiths, M. D. (2007). A qualitative investigation of problem gambling as an escape-based coping strategy. *Psychol Psychother*. 80, 107-125.

Wood, R. T., & Williams, R. J. (2009). Internet gambling: prevalence, patterns, problems, and policy options. Final report prepared for the Ontario Problem Gambling Research Centre.

Wood, R.T., & Williams, R.J. (2011). A comparative profile of the Internet gambler: demographic characteristics, game-play patterns, and problem gambling status. *New Media & Society*, 13, 1123–1141.

Wood, R.T., Williams, R. J., & Lawton, P. (2007). Why do Internet gamblers prefer online versus land-based venues?. *Journal of Gambling Issues*, 20, 235–252.

Web References

Australian Parliamentary Joint Select Committee on Gambling Reform (2011). First report: The design and implementation of a mandatory pre-commitment system for electronic gaming machines Available at: http://www.aph.gov.au/binaries/senate/committee/gamblingreform_ctte/precommitment_scheme/report/report.pdf (accessed 7th June 2014)

eCOGRA (2007). An exploratory investigation into the attitudes and behaviours of Internet, casino and poker players. eCOGRA. An exploratory investigation into the attitudes and behaviours of Internet, casino and poker players. eCOGRA. (accessed 21 June 2012)

Ferris. T., & Wynne, H. (2001). The Canadian problem gambling Index: final report. Submitted for the Canadian Centre on Substance Abuse. ccgr.ca/sites/default/files/CPGI-Final-Report-English.pdf (accessed 11 July 2012)

Global Betting and Gaming Consultants (2009). Interactive gambling report. September. Available at: http://www.gbgc.com/publications/Internet-gambling-report . (accessed 23 August 2013)

Appendix 1: Factor Analysis - Principle component analysis (PCA)

PCA_1: The first PCA, relating to motivations for gambling, using Direct Oblimin rotation is based on a respondents level of agreement with a number of motivational factors including: to relax; it's exciting; to relieve boredom; to win money; to socialise, to take my mind off other things; to earn income; to compete with others; to vent aggression; it's fun; to be mentally challenged; and to do something I enjoy for a change. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, (KMO = 0.83) which is 'very good' (Field, 2009), and KMO values for all individual items is >0.55, which is above the acceptable limit of 0.5 (Field 2009). Bartlett's test of sphericity (χ^2=1390.81, df 66, p<0.001) indicated that correlations between items are sufficiently large for PCA (Field 2009). The initial analysis suggested that all twelve items had eigenvalues over Kaiser's criterion of 1 and in combination they explained 58.63% of the variance. Given the sample size and the number of variables, factors with eigenvalues of at least 0.7 are accepted resulting in 5 factors, 12 variables, accounting for 71.61% of the variance being used. All twelve variables loaded onto the factors as pure variables (loaded onto one factor). Table 1, represents the rotated component matrix of motives for gambling. The loadings represent the correlation coefficients between the variables and the factors with the higher loading values representing a higher contribution to the variable.

Table 1: Rotated component matrix of motivations to gamble (PCA_1)

Variable\Factor	$Factor_1$	$Factor_2$	$Factor_3$	$Factor_4$	$Factor_5$
To relieve boredom	0.711	-	-	-	-
It's exciting	0.704	-	-	-	-
To relax	-	0.858	-	-	-
To vent aggression in a socially acceptable way	-	0.832	-	-	-
To take my mind off other things	-	0.605	-	-	-
To win money	-	-	0.793	-	-
To earn income	-	-	0.778	-	-
To be mentally challenged	-	-	-	0.854	-
To do something I enjoy for a change	-	-	-	0.810	-
It's fun	-	-	-	0.634	-
To socialise	-	-	-	-	0.984
To compete with others	-	-	-	-	0.466

Note: $Factor_1$: Excitement - factors that allow the individual to be delighted and invigorated; $Factor_2$: Escape and Relaxation - factors that provide an outlet enabling the individual to forget about current problems and challenges: $Factor_3$: Financial Motivation- to earn income and win money; $Factor_4$: Autonomy and Mastery - factors associated with independence and expertise; $Factor_5$: Social and Competition - to meet others and compete. Each of these five extracted factors relating to 'gambling motivation' are subject to a Cronbach Alpha test as follows: $Factor_1$ with 2 items and a Cronbach's Alpha of 0.623; $Factor_2$ with 3 items and a Cronbach's Alpha of 0.641; $Factor_3$ with 2 items and a Cronbach's Alpha of 0.611; $Factor_4$ with 3 items and a Cronbach's Alpha of 0.775; $Factor_5$ with 2 items and a Cronbach's Alpha of 0.648; and overall Cronbach's Alpha is 0.814 with a total of 12 items.

The results suggest that there is an acceptable level of consistency between questions in each of the five groups. A correlation matrix of motivational factors is included in Appendix 1, and given no value is above 0.5, this suggests acceptable levels of multicollinearity and thus justifies treating the factors as individually, (Alm 1998, Gujarati 2003). To determine if there are influencing factors between PGSI scores and a player's motivation to gamble, a regression analysis is undertaken.

PCA_2: The second PCA focuses on 52 statements relating to player perceptions of current responsible gambling features and tools, with Direct Oblimin rotation. This resulted in six coherent factors being identified, (Table 2), which are the focus of a correlation matrix, (Appendix 2). Given no value is above 0.5, this suggests that there are low levels of multicollinearity between these behavioural factors and thus the factors should be treated individually, (Alm 1998, Gujarati 2003). A Cronbach Alpha Test, suggests that there is an acceptable level of consistency between questions in each of the six groups.

Table 2: Rotated component matrix of responsible gambling practices and behaviours (PCA_2)

Component/Factors	$Factor_1$	$Factor_2$	$Factor_3$	$Factor_4$	$Factor_5$	$Factor_6$
Gambling operators should co-operate with stakeholders (e.g. researchers, government, charities) in order to advance our understanding of player behaviour (n=357)	0.808	-	-	-	-	-
Gambling operators should analyse player behaviour patterns to identify problem gambling (n=356)	0.795	-	-	-	-	-
Gambling operators should allow researchers to have access to the player information so that they can better understand problem gambling (n=357)	0.765	-	-	-	-	-
Customer service staff should take action if they see signs of problem gambling (n=353)	0.759	-	-	-	-	-

Table 2 continued ...

Component/Factors	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
Customer service staff should be trained to recognise signs of problem gambling (n=356)	0.725	-	-	-	-	-
Terms and conditions for bonuses are clearly communicated (n=373)	-	0.778	-	-	-	-
Terms and conditions for bonuses are fair (n=374)	-	0.769	-	-	-	-
Internet gambling sites are open and honest regarding the terms of conditions of gambling on their site (n=375)	-	0.720	-	-	-	-
Terms and conditions are necessary to ensure some players do not abuse the bonus system (n=373)	-	0.715	-	-	-	-
Online random number generators are used to determine the outcome of games (n=372)	-	0.493	-	-	-	-
Terms and conditions for bonuses are deceptive (n=356)	-	-0.451	-	-	-	-
Internet gambling software is fair (n=377)	-	0.414	-	-	-	-
When I have spoken to customer service staff they seem to know about issues related to problem gambling (n=354)	-	-	0.859	-	-	-
When I have spoken to customer service staff they put my welfare first (n=354)	-	-	0.850	-	-	-
Gambling operators should not be under any obligation to do research other than to advance their own commercial objectives (n=357)	-	-	0.527	-	-	-
Self-exclusion is ineffective since players can simply choose to play at another site (n=359)	-	-	-	0.787	-	-
It is easy to get around the self-exclusion system for any one site (self-exclusion being where a player requests to be denied access to a site for a specified period of time) (n=362)	-	-	-	0.734	-	-
For self-exclusion to work all sites need to co-operate to have an industry-wide 'self-exclusion' system (n=360)	-	-	-	0.684	-	-
Internet gambling websites should provide information regarding how to spot problem gambling (n=360)	-	-	-	0.497	-	-
Internet gambling websites should provide information regarding where to get help (n=360)	-	-	-	0.473	-	-
Play-for-free versions of a game should be exactly the same as the real version (n=375)	-	-	-	-	0.670	-
Gambling operators should not design games using characteristics they know to be addictive (n=375)	-	-	-	-	0.634	-
The main priority for customer service staff is to keep consumers happy so they keep spending money (n=374)	-	-	-	-	0.612	-
Having detailed information on my gaming and betting choices is useful (n=372)	-	-	-	-	0.448	-
In relation to player protection and social responsibility, gambling operators should NOT be held accountable to regulators provided they are operating within the limits of the law (n=358)	-	-	-	-	-0.410	-
As a player I would like to receive information about how I play (n=361)	-	-	-	-	-	0.883
I should get information about how I play regardless of whether or not I request it (n=359)	-	-	-	-	-	0.799
Having detailed information on how much money I have spent would be useful (n=360)	-	-	-	-	-	0.599
Having detailed information on how much time I have spent would be useful (n=360)	-	-	-	-	-	0.58

Note: Extraction method: principal component analysis of 6 factors. Rotated method: Direct Oblimin. Converged in 23 iterations. $Factor_1$: Proactive responsible gambling; $Factor_2$: Transparent terms and conditions; $Factor_3$: Customer Service; $Factor_4$: Self-exclusion and self-help; $Factor_5$: Game design; $Factor_6$: Player Information, Behaviour and Transaction. Each of these six extracted factors relating to 'responsible gambling practices and behaviours' are subject to a Cronbach's Alpha test as follows: $Factor_1$ with 5 items and a Cronbach's Alpha of 0.873; $Factor_2$ with 7 items and a Cronbach's Alpha of 0.751; $Factor_3$ with 3 items and a Cronbach's Alpha of 0.775; $Factor_4$ with 5 items and a Cronbach's Alpha of 0.834; $Factor_5$ with 5 items and a Cronbach's Alpha of 0.542; $Factor_6$ with 4 items and a Cronbach's Alpha of 0.820; and overall Cronbach's Alpha is 0.853 with a total of 29 items.

The results suggest that there is an acceptable level of consistency between questions in each of the six groups. The relatively low alpha value for 'game design' is acceptable given the consistency between this variable and other values as reflected by the overall Cronbach alpha value of 0.853.

Appendix 2: Player motivational factors and PGSI catergories considering no problem group as a reference group

PGSI group M_b					
Low Problem	Intercept	0.612	0.190	1	0.001
	Excitement	-0.645	0.188	1	0.001
	Escape and Relaxation	0.348	0.199	1	0.081
	Social and Competition	0.442	0.194	1	0.023
Moderate Problem	Intercept	0.656	0.192	1	0.001
	Excitement	-0.934	0.203	1	0.000
	Escape and Relaxation	0.544	0.202	1	0.007
	Financial	-0.557	0.185	1	0.003
	Social and Competition	0.343	0.194	1	0.077
Problem					
	Excitement	-0.501	0.212	1	0.018
	Escape and Relaxation	0.175	0.224	1	0.000
	Financial	-0.695	0.202	1	0.001
	Social and Competition	0.406	0.223	1	0.069
Model		Fitting Criteria (-2 Log Likelihood)	Chi-Square		
Intercept Only		992.587			
Final		861.054	131.533	15	0.000
Pseudo R^2		0.303			
Classification Accuracy		43.1%			

*Problem group used as a reference group

Appendix 3: Responsible gambling practices and behaviours with PGSI categories considering no problem as a reference group

PGSI group M_b**					
Low Problem					
	Self-exclusion and Self-help	0.479	0.202	1	0.018
Moderate Problem	Intercept	0.402	0.174	1	0.021
	Proactive Responsible Gambling	0.406	0.211	1	0.055
	Transparent terms & conditions	0.414	0.177	1	0.019
Problem					
	Game Design	0.369	0.215	1	0.086
Model Parameters		Fitting Criteria (-2 Log Likelihood)	Chi-Square		
Intercept Only		753.440			
Final		720.521	32.920	18	0.017
Pseudo R^2		0.119			
Accuracy		36.20%			

**No problem group used as a reference group

TABLES

Table 1: The measurement model fit indices

Index	Description	Value	Threshold
Average Path Coefficient (APC)	The regression values of independent variables on the dependent ones	0.170, P<0.05	P<0.05
Average R-squared (ARS)	The variance explained in the dependent variable by the independent variables	0.102, P<0.05	P<0.05
Average Adjusted R-squared (AARS)	Corrects the spurious increases in R-squared coefficients due to predictors that add no explanatory value in each latent variable block	0.175, P<0.05	P<0.05
Average block VIF (AVIF)	Checks the vertical collinearity in the model's latent variable blocks	1.139	acceptable if ≤ 5
Average full collinearity VIF (AFVIF)	It checks the multicollinearity of the whole model	1.386	ideally if ≤ 3.3
Tenenhaus GoF (GoF)	A measure of a model's explanatory power	0.275	small ≥ 0.1, medium ≥ 0.25, and large ≥ 0.36
Sympson's paradox ratio (SPR)	A measure of the extent to which a model is free from Simpson's paradox instances	0.700	acceptable if ≥ 0.7
R-squared contribution ratio (RSCR)	A measure of the extent to which a model is free from negative R-squared contributions	0.977	acceptable if ≥ 0.9
Statistical suppression ratio (SSR)	A measure of the extent to which a model is free from statistical suppression instances	1.000	acceptable if ≥ 0.7
Nonlinear bivariate causality direction ratio (NLBCDR)	A measure of the extent to which bivariate nonlinear coefficients of association provide support for the hypothesized directions of the causal links in a model	0.800	acceptable if ≥ 0.7

Table 2: The measurement model of the player motivational factors (SEM1)

Constructs	Indicators	Loading	AVEs	Cronbach's alpha	Composite reliability
Excitement	It's exciting	(0.854)	0.730	0.629	0.844
	To relieve boredom	(0.859)			
Escape and relaxation	To relax	(0.691)	0.584	0.641	0.807
	To vent aggression in a socially acceptable way	(0.791)			
	To take my mind off other things	(0.805)			
Financial motivation	To win money	(0.851)	0.723	0.618	0.839
	To earn income	(0.861)			
Autonomy and mastery	To be mentally challenged	(0.837)	0.679	0.763	0.864
	To do something I enjoy for a change	(0.860)			
	It's fun	(0.773)			
Social and competition	To socialise	(0.871)	0.725	0.621	0.841
	To compete with others	(0.862)			
Problem Gambling Severity Index	Convenience	0.781	0.633	0.935	0.945
	Privacy and anonymity	0.793			
	Availability of higher jackpots	0.849			
	Availability of better odds	0.831			
	Faster games	0.835			
	The fact that you are not playing with actual cash but e-cash	0.739			
	The fact you can play more than one game at a time	0.829			
	The fact it's not as exciting as land based gambling	0.729			
	The availability of better tools to help you gamble safer	0.759			
	Promotions	0.801			

Table 3: The fit indices of the measurement model for SME_2

Index	Value	Threshold
Average Path Coefficient (APC)	0.138, P<0.05	P<0.05
Average R-squared (ARS)	0.403, P<0.01	P<0.05
Average Adjusted R-squared (AARS)	0.382, P<0.01	P<0.05
Average block VIF (AVIF)	4.498	acceptable if ≤ 5
Average full collinearity VIF (AFVIF)	2.654	ideally if ≤ 3.3
Tenenhaus GoF (GoF)	0.494	small ≥ 0.1, medium ≥ 0.25, and large ≥ 0.36
Sympson's paradox ratio (SPR)	0.767	acceptable if ≥ 0.7
R-squared contribution ratio (RSCR)	0.929	acceptable if ≥ 0.9
Statistical suppression ratio (SSR)	1.000	acceptable if ≥ 0.7
Nonlinear bivariate causality direction ratio (NLBCDR)	1.000	acceptable if ≥ 0.7

Notation: for definition of index see Table 1.

Table 4: The measurement model of responsible gambling practices and behaviours SEM_2

Constructs	Indicators	Loadings	AVEs	Cronbach's alpha	Composite reliability
Proactive responsible gambling	Gambling operators should co-operate with stakeholders	0.667			
	Gambling operators should analyse player behaviour to identify problem	0.777	0.520	0.773	0.730
	Gambling operators should allow researchers to access player information	0.721			
Transparent terms and conditions	Terms and conditions for bonuses are clearly communicated	0.847			
	Terms and conditions for bonuses are fair	0.858			
	Internet gambling sites are open and honest	0.848			
	Terms & conditions are necessary to ensure players do not abuse the system	0.885	0.665	0.915	0.933
	Online random number generators are used to determine the game's outcome	0.760			
	Terms and conditions for bonuses are deceptive	0.715			
	Internet gambling software is fair	0.783			
Customer Service	When I have spoken to customer service they seem to know related issues	0.544			
	When I have spoken to customer service staff they put my welfare first	0.751	0.520	0.720	0.760
	Gambling operators should not be under any obligation to do research	0.839			
Self-exclusion and self-help	Self-exclusion is ineffective as players can simply choose to play at another site	0.934			
	It is easy to get around the self-exclusion system for any one site	0.803			
	All sites need to co-operate to have an industry-wide 'self-exclusion' system	0.944	0.832	0.948	0.961
	Internet gambling websites should provide information on problem gambling	0.946			
	Internet gambling websites should provide information on where to get help	0.924			
Game design	Play-for-free versions of a game should be exactly the same as the real version	0.907			
	Gambling operators should not design games using addictive characteristics	0.857			
	The main priority for customer service is to keep consumers happy to keep spending	0.885	0.670	0.801	0.874
	Having detailed information on my gaming and betting choices is useful	0.864			
	Gambling operators should NOT be held accountable to regulators	0.518			
Consumer Information, Behaviour &Transaction	As a player I would like to receive information about how I play	0.746			
	I should get information about how I play regardless of whether or not I request it	0.890	0.594	0.804	0.854
	Having detailed information on how much money I have spent would be useful	0.839			
	Having detailed information on how much time I have spent would be useful	0.551			
Problem Gambling Severity Index	Convenience	0.781			
	Privacy and anonymity	0.793			
	Availability of higher jackpots	0.849			
	Availability of better odds	0.831			
	Faster games	0.835	0.633	0.935	0.945
	The fact that you are not playing with actual cash but e-cash	0.739			
	The fact you can play more than one game at a time	0.829			
	The fact it's not as exciting as land based gambling	0.729			
	The availability of better tools to help you gamble safer	0.759			
	Promotions	0.801			

Table 5: Regression Model$_1$ - Player motivational factors and PGSI scores

Factors	β	Std Error	t stat	*P*-value	VIF	Model
Constant	4.362	0.239	18.220	<0.001	-	-
Excitement	0.452	0.261	1.728	0.085	1.158	-
Escape and Relaxation	-0.717	0.265	-6.475	<0.001	1.218	-
Financial	0.972	0.245	3.975	<0.001	1.038	-
Autonomy and Mastery	-0.371	0.279	-1.328	0.185	1.351	-
Social and competition	-0.619	0.272	-2.278	0.023	1.273	-
Model parameters						
F Value						14.558
Df						5
R^2						0.169
R^2 Adjusted						0.157
P-value						<0.001

Notation: Independent variable is PGSI individual score; VIF refers to variance inflation factor.

Table 6: Regression Model$_2$ - Responsible gambling practices and behaviours factors and PGSI individual scores

Factors	β	Std Error	t stat	*P*-value	VIF	Model
Constant	4.216	0.286	14.762	<0.001	-	
Proactive Responsible Gambling	0.103	0.348	0.296	0.768	1.460	-
Transparent Terms and Conditions	0.482	0.290	1.661	0.098	1.053	-
Customer Service	-0.504	0.305	-1.652	0.101	1.064	-
Self-exclusion and Self-help	-0.932	0.313	-2.981	0.003	1.129	-
Game Design	0.601	0.305	1.967	0.050	1.129	-
Player Information, Behaviour and Transactions	-0.495	0.391	-1.267	0.206	1.767	-
Model parameters						
F Value						2.753
Df						6
R^2						0.570
R^2 Adjusted						0.360
P-value						0.013

Notation: Independent variable is PGSI individual score; VIF refers to variance inflation factor.

Table 7: Player motivational factors with PGSI catergories

PGSI group M_a*	Factors	β	Std Error	Df	*P*-value
No Problem					
	Excitement	0.501	0.212	1	0.018
	Escape and Relaxation	-0.175	0.224	1	<0.001
	Financial	0.695	0.202	1	0.001
	Social and Competition	-0.406	0.223	1	0.069
Low Problem	Intercept	0.448	0.177	1	0.012
	Escape and Relaxation	-0.827	0.189	1	<0.001
	Financial	0.459	0.184	1	0.013
Moderate Problem	Intercept	0.492	0.180	1	0.006
	Excitement	0.433	0.196	1	0.027
	Escape and Relaxation	-0.631	0.178	1	<0.001
Model		Fitting Criteria (-2 Log Likelihood)	Chi-Square		
Intercept Only		992.587			
Final		861.054	131.533	15	<0.001
Pseudo R^2		0.303			
Classification Accuracy		43.1%			

*Problem group used as a reference group.

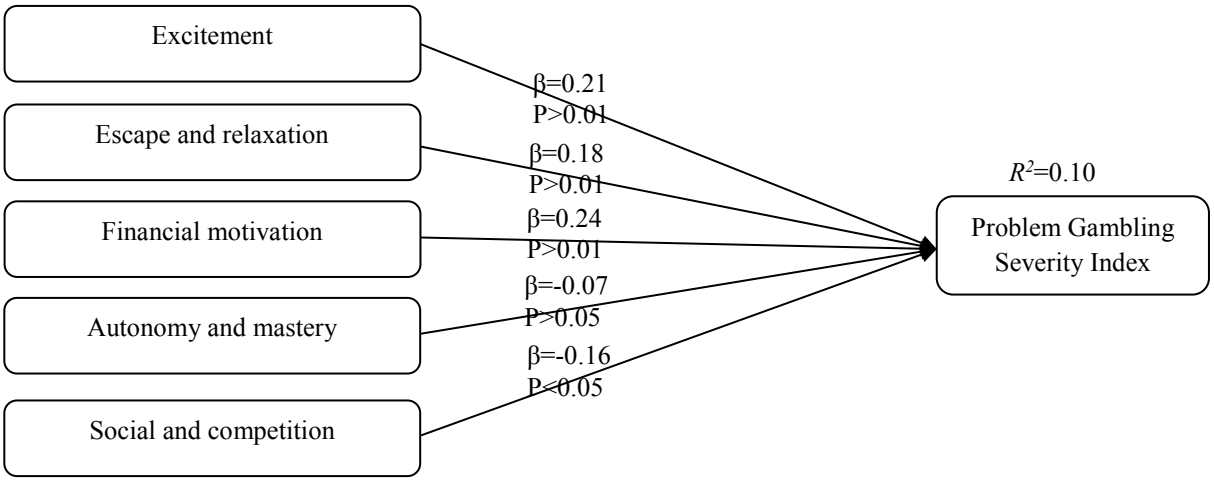
Table 8: Responsible gambling practices and behaviours with PGSI categories

PGSI group M_a*	Factors	β	Std Error	Df	*P*-value
No Problem					
	Game Design	-0.369	0.215	1	0.086
Low Problem	Intercept	0.392	0.194	1	0.044
	Self-exclusion and Self-help	0.770	0.216	1	<0.001
	Player Information, Behaviour and Transactions	0.503	0.261	1	0.054
Moderate Problem	Intercept	0.582	0.187	1	0.002
	Transparent terms & conditions	0.315	0.184	1	0.087
	Self-exclusion and Self-help	0.340	0.202	1	0.093
Model Parameters		Fitting Criteria (-2 Log Likelihood)	Chi-Square		
Intercept Only		753.440			
Final		720.521	32.920	18	0.017
Pseudo R^2		0.119			
Accuracy		36.20%			

*Problem group used as a reference group.

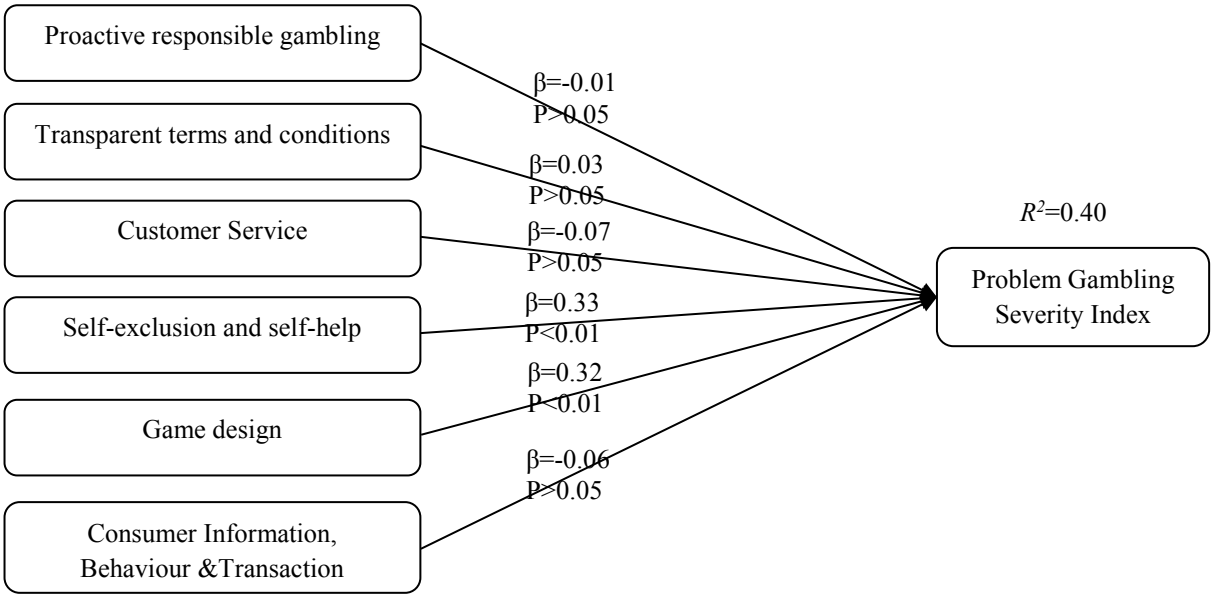
FIGURES

Figure 1: The structural model (SEM_1) for player motivational factors



Source: own Figure.

Figure 2: The structural model (SEM_2) for responsible gambling practices and behavioural factors



Source: own Figure.